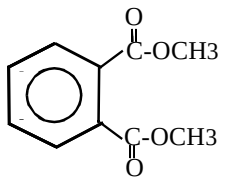
DIMETHYL PHTHALATE

Dimethyl phthalate is a federal hazardous air pollutant and was identified as a toxic air contaminant in April 1993 under AB 2728.

CAS Registry Number: 131-11-3

Molecular Formula: $C_{10}H_{10}O_4$



Dimethyl phthalate is an oily liquid with a slight aromatic odor. It is soluble in mineral oil; miscible with alcohol, ether, and chloroform; and practically insoluble in water, petroleum ether, and other paraffin hydrocarbons (Merck, 1983). Dimethyl phthalate is also combustible (Sax, 1987).

Physical Properties of Dimethyl Phthalate

Synonyms: 1,2-benzenedicarboxylic acid dimethyl ester; phthalic acid dimethyl ester; methyl phthalate; dimethyl 1,2-benzenedicarboxylate; DMP; Palatinol M; Fermine; Avolin; Mipax

Molecular Weight:	194.19
Boiling Point:	283.7 °C
Melting Point:	5.5 °C
Flash Point:	146 °C (295 °F) closed cup
Vapor Density:	6.69 (air = 1)
Density/Specific Gravity:	1.1940 at 20/20 °C (water = 1)
Vapor Pressure:	0.00165 mm Hg at 25 °C
Log Octanol/Water Partition Coefficient:	1.56
Henry's Law Constant:	1.1 x 10^{-7} atm-m^3/mole
Conversion Factor:	1 ppm = 7.94 mg/m^3

(Howard, 1990; HSDB, 1991; Merck, 1983; Sax, 1989)

SOURCES AND EMISSIONS

A. Sources

Dimethyl phthalate is used as a plasticizer for nitrocellulose and cellulose acetate, resins and rubber. It is also used in solid rocket propellants, lacquers, plastics, rubber, coating agents, safety glass, and molding powders (Howard, 1990).

Dimethyl phthalate was registered for use as a pesticide; however as of December 31, 1991, it is no longer registered for pesticidal use in California (DPR, 1996).

The primary stationary sources that have reported emissions of dimethyl phthalate in California are manufacturers of miscellaneous plastics products (ARB, 1997b).

B. Emissions

The total emissions of dimethyl phthalate from stationary sources in California are estimated to be at least 1,800 pounds per year, based on data reported under the Air Toxics Hot Spots Program (AB 2588) (ARB, 1997b).

C. Natural Occurrence

No information about the natural occurrence of dimethyl phthalate was found in the readily-available literature.

AMBIENT CONCENTRATIONS

No Air Resources Board data exist for ambient measurements of dimethyl phthalate.

INDOOR SOURCES AND CONCENTRATIONS

No information about the indoor sources and concentrations of dimethyl phthalate was found in the readily-available literature.

ATMOSPHERIC PERSISTENCE

Based on its vapor pressure, dimethyl phthalate is expected to exist in the atmosphere in the gas phase (as observed by Ligocki et al. (1985) for diethylphthalate). In the gas phase, dimethyl phthalate will react with the OH radical, and be subject to wet deposition (Ligocki et al., 1985). The atmospheric half-life and lifetime of dimethyl phthalate due to reaction with the OH radical are calculated to be about 15 to 20 days and 25 days, respectively (Atkinson, 1995).

AB 2588 RISK ASSESSMENT INFORMATION

Dimethyl phthalate emissions are not reported from stationary sources in California under the AB 2588 program. It is also not listed in the California Air Pollution Control Officers Association Air Toxics “Hot Spots” Program Revised 1992 Risk Assessment Guidelines as having health values (cancer or non-cancer) for use in risk assessments (CAPCOA, 1993).

HEALTH EFFECTS

Probable routes of human exposure to dimethyl phthalate are inhalation and ingestion.

Non-Cancer: Dimethyl phthalate is an irritant of the eyes and upper respiratory tract. The United States Environmental Protection Agency (U.S. EPA) has determined that there are inadequate data for the establishment of a Reference Concentration (RfC) for dimethyl phthalate. An oral Reference Dose (RfD) is still under review, but a provisional RfD of 10 milligrams per kilogram per day has been calculated. The U.S. EPA estimates that consumption of this dose or less, over a lifetime, would not likely result in the occurrence of chronic, non-cancer effects (U.S. EPA, 1994a).

No information is available on adverse reproductive or developmental effects in humans, and limited information is available in animals (U.S. EPA, 1994a).

Cancer: No information on the carcinogenicity of dimethyl phthalate in humans is available. The U.S. EPA has classified dimethyl phthalate as Group D: Not classifiable as to human carcinogenicity (U. S. EPA, 1994a). The International Agency for Research on Cancer has not classified dimethyl phthalate as to its carcinogenicity (IARC, 1987a).